

NOTES ON COLLECTIONS OF FISHES FROM OAHU ISLAND
AND LAYSAN ISLAND, HAWAII, WITH DESCRIPTIONS
OF FOUR NEW SPECIES.

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In the autumn of 1903 a collection of fishes was received by the U. S. Bureau of Fisheries from the market at Honolulu. They were selected and preserved by Mr. E. L. Berndt, inspector of fisheries of Honolulu, and acting assistant to the U. S. Bureau of Fisheries.

At about the same time a series of fishes was sent to Stanford University from Laysan Island, about 800 miles to the westward of Oahu. These were collected by Mr. Max Schlemmer, superintendent of the guano industry of Laysan.

An account of these collections is given in this paper. Plates of the new species will be published in the final report on the Hawaiian fishes.

We have also included three species obtained at Hilo by Mr. Henry W. Henshaw.

The following species are new to the fauna of the Hawaiian Islands:

Alopias vulpes (Gmelin), Oahu.

Galeocerdo tigrinus Müller and Henle, Oahu.

Brachysomophis henshawi Jordan and Snyder, Oahu.

Ariomma lurida Jordan and Snyder, Oahu.

Thalassoma ancitense (Günther), Oahu.

Lactoria schlemmeri Jordan and Snyder, Laysan.

Antennarius laysaninus Jordan and Snyder, Laysan.

Family ALOPIIDÆ.

1. ALOPIAS VULPES (Gmelin).

A large specimen from the market of Honolulu.

Family CARCHARIIDÆ.

2. GALEOCERDO TIGRINUS Müller and Henle.

Galeocerdo rayneri MACDONALD and BARRON, Proc. Zool. Soc., 1868, p. 368, pl. XXXII, not *Galeus maculatus* Ranzani of the Atlantic.

One large specimen, answering well to the description and figure given by Macdonald and Barron, except that the coloration is brighter, the black spots along the base of the dorsal being bright, and the short, black, vertical bands below them conspicuous. A stuffed specimen from Nagasaki, called *Galeocerdo tigrinus* by Jordan and Fowler^a although faded, shows the same color markings.

It seems certain that the original *Galeocerdo tigrinus* of Müller and Henle, from Pondicherry, is the same species, and that the species with spots, instead of vertical bars below the dorsal, *Galeocerdo maculatus* (Ranzani), is probably confined to the Atlantic.

Family OPHICHTHYIDÆ.

3. MICRODONOPHIS FOWLERI Jordan and Evermann.

4. BRACHYSOMOPHIS HENSHAWI Jordan and Snyder, new species.

Head measured to gill opening, 7.5 in length, 3.8 in length to vent; depth 2.5 in head; eye 1.5 in snout; snout 10 in head.

Body cylindrical, the head greatly depressed, swollen laterally in the region of the occiput, narrowing anteriorly to the pointed snout; a conspicuous transverse depression in the post-orbital region; inter-orbital space concave, its width equal to length of snout; a slight supra-orbital crest, ending in a prominent wart-like protuberance behind eye. Nostrils with minute tubes, the anterior located midway between tip of snout and eye, the posterior on lip between eye and anterior nostril. Mouth large, length of cleft contained 2.8 in head; lower jaw projecting beyond the upper; outer edge of lips with a row of rather coarse papillæ. Teeth of upper jaw in two rows, the outer ones small and close set, the inner ones larger; vomer with a single row of five or six widely-spaced canines, the anterior of which is about equal in length to diameter of eye, the others growing successively smaller; tip of jaw with three minute teeth separated from the lateral rows by a wide space; lower jaw with a single row of widely-spaced fang-like teeth. Teeth all sharply pointed; many of them in both jaws depressible. No tongue. Gill openings below middle of body, their length equal to width of space between them or to distance between tip of snout and posterior border of eye.

One-fourth of base of pectoral above gill opening; length of pectoral equal to distance between tip of snout and center of pupil. Dor-

^aProc. U. S. Nat. Mus., XXVI, 1903, p. 612.

sal inserted behind gill opening, a distance contained two times in space between gill opening and pupil; height of fin a short distance behind its origin about equal to diameter of pupil, slightly higher in region above vent; origin of anal just behind vent; height of fin equal to that of dorsal; both dorsal and anal become low on posterior part of tail, the membranes growing thick, passing into slight ridges and finally disappearing near tip of tail.

A row of large mucous tubes passing over head in the depression behind eye; six conspicuous tubes on top of head, four being on the interorbital region, two on the snout; four tubes on upper lip; anterior ends of lateral line connected by a curved row of tubes passing over occiput; about 125 tubes in lateral line, the posterior ones very small.

Color gray, with a yellowish tint; a few brownish-black spots about as large as pupil thinly scattered above the lateral line, the mucous pores on anterior part of body edged with black; dorsal brownish-black, with a broad marginal band of white, posterior part of fin without dark color; anal immaculate.

One specimen, 485 millimeters long.

Type.—No. 51399, U. S. National Museum. Honolulu. Collector, Mr. E. L. Berndt.

Named for Henry W. Henshaw, the well-known naturalist, now resident at Hilo, Hawaii, to whom we are indebted for several rare specimens.

The large Japanese eel described by Schlegel as *Ophisurus porphyreus*, has the lips fringed and should be referred to *Brachysomophis* instead of *Mystriophis*. It may stand as *Brachysomophis porphyreus*.

Family MURAENIDÆ.

5. MURAENA KAILUÆ Jordan and Evermann.

One specimen from Honolulu and one from Laysan Island.

6. ENCHELYNASSA BLEEKERI Kaup.

? *Gymnothorax vinolentus* JORDAN and EVERMANN, Bull. U. S. Fish Commission, 1903, p. 165; Honolulu.

A very large example, 124 centimeters long, apparently identical with the scantily-described *Enchelynassa bleekeri* of Kaup. *Gymnothorax vinolentus* is doubtless the young of the same species, although the number of teeth is considerably different from that shown in our specimen. The genus *Enchelynassa* is well distinguished by the large size of the posterior nostril, which in form suggests the nostril of a horse.

The head measured to gill opening is contained 7.1 in the length; snout 5.5 in head; eye 3 in snout; interorbital space, 1.5; cleft of mouth 1.75 in head. Origin of dorsal on a vertical passing midway

between angle of mouth and gill-opening; height of fin about equal to length of snout, the membrane very thick and fleshy; anal arising immediately behind vent, its height equal to one-half the length of snout; both dorsal and anal continuous with the very short caudal. Tail slightly longer than head and body. Depth 9 in the length. Anterior nostril located at a point one-third the distance between tip of snout and border of eye, the edge with a low, thickened rim and a posterior cirrus with tentacles; posterior nostrils situated on dorsal side of snout half way between anterior nostrils and eye, the opening oval, surrounded by a broad, thin membrane. Teeth lanceolate canines, the lateral notches not evident on some of the smaller ones; those of upper jaw in two rows, the inner ones larger, their length about equal to two-thirds the diameter of eye; a row of four or five long teeth on vomer, followed by a short row of small teeth; anterior vomerine teeth and those of inner series of jaw depressible; teeth of lower jaw in two series, the inner row having four or five large, depressible ones. Width of gill-opening equal to or slightly more than half the length of snout.

Color in alcohol wine-brown, with a few small, darker spots scattered over the body. We have a third specimen from Samoa.

7. *GYMNOTHORAX THALASSOPTERUS* Jenkins; Honolulu.

8. *GYMNOTHORAX STEINDACHNERI* Jordan and Evermann; Honolulu.

9. *GYMNOTHORAX LAYSANUS* Steindachner; Honolulu.

Family AULOSTOMIDÆ.

10. *AULOSTOMUS VALENTINI* (Bleeker); Honolulu; Laysan.

Family CARANGIDÆ.

11. *ALECTIS CILIARIS* (Bloch); Honolulu.

Family SERRANIDÆ.

12. *PIKEA AURORA* Jordan and Evermann; Honolulu.

13. *ANTHIAS FUSCIPINNIS* Jenkins; Honolulu.

Family APOGONIDÆ.

ARIOMMA Jordan and Snyder, new genus

(Type, *Ariomma lurida* Jordan and Snyder, new species).

Body not greatly compressed; caudal peduncle slender, cylindrical; head large; eyes large, with thin, adipose lids; mouth small, the maxillary short, broad, rounded posteriorly; jaws with teeth, none on vomer and palatines. Pseudobranchiæ present. Preopercle smooth. Head and body with scales, about 55 in lateral series. Soft dorsal and anal elongate.

14. *ARIOMMA LURIDA* Jordan and Snyder, new species.

This species is represented by two specimens about 190 mm. long, in a very bad state of preservation, the scales having all been lost and the fins broken.

Head, 2.9 in length measured to base of caudal; depth, 4; depth of caudal peduncle, 7 in head; eye, 3; snout, 3.3; interorbital space, 4; dorsal spines, 10; rays, 17; anal, 15; pectoral, 20; scales in lateral series, 55 or more.

Width of body equal to a little more than half the depth, the caudal peduncle cylindrical and markedly slender. Interorbital space slightly convex. Lower jaw projecting a little beyond the upper; length of maxillary equal to width of interorbital space; jaws with a single row of slender, minute teeth, those on lower jaw curved backward; no teeth on vomer or palatines; pseudo branchiæ large; gill rakers on first arch, 9 + 19, those near angle long and slender, the others growing successively shorter toward either end of arch. Preopercle entire. Eye extremely large, with thin, transparent, adipose lids, the posterior extending to edge of pupil, the anterior not more than one-fifth as wide. Nostrils located near tip of snout.

Body with scales, probably between 55 and 65 in a lateral series; scales probably present on the head, including upper part of snout and cheeks, scale pits being present on occiput and below eye. Lateral line apparently present, its anterior part located below base of dorsal a distance equal to diameter of pupil.

Origin of dorsal above base of pectoral; soft dorsal and anal extending an equal distance posteriorly, the length of the caudal peduncle measured to bases of upper and lower rays equal to length of maxillary. Ventrals inserted on a vertical through second or third dorsal spine. Whether the anterior rays of anal are spinous or articulate could not be determined.

No distinctive color markings are visible, the general shade being a lurid brown.

Type.—No. 51400, U. S. National Museum. Co-type, No. 8441, Stanford University. Honolulu, Hawaiian Islands. Collector, Mr. E. L. Berndt.

Family LABRIDÆ.

15. *THALASSOMA ANEITENSE* (Günther).

One specimen poorly preserved, measuring 132 mm. in length, from Honolulu.

Head 3.7 in length to base of caudal; depth 3.4; snout 2.8 in head; eye 5.3; interorbital space 4; scales in lateral series 26; in series between spinous dorsal and origin of anal 11; dorsal spines 8; rays 13; anal spines 2; rays 11.

Teeth in both jaws growing gradually shorter from before backward; no enlarged teeth or canines. Head smooth; scales smaller on breast and belly than on sides and back. Lateral line extending along fourth row of scales to below base of eleventh articulated ray, where it bends downward across three rows of scales and passes along middle of caudal peduncle. First dorsal spine equal in length to about two-thirds diameter of orbit, the others successively longer, the last being 1.6 times diameter of orbit; articulated rays higher, about twice diameter of orbit. Anal spines rather strong, the first equal in height to third dorsal spine; the second equal to last dorsal spine. Dorsal and anal rays about equal in height. Pectoral 1.4 in head. Caudal probably truncate. Ventral 2 in head.

Color in spirits, pale brownish, the head dusky above; two dusky bars passing backward from eye, the lower of which extends toward angle of opercle; a broad semicircular bar extending from chin toward eye and bending downward toward lower edge of opercle; a smaller semicircular bar below the latter; scales with small white spots; distal half of pectoral blackish, the color fading out toward the lower edge; dorsal with a dark spot about the size of pupil on membrane of second and third spines.

Family CHÆTODONTIDÆ.

16. CHÆTODON MILIARIS Quoy and Gaimard; Honoïulu.
17. CHÆTODON FREMBLII Bennett; Honolulu; Laysan.
18. CHÆTODON QUADRIMACULATUS Gray; Honolulu.
19. MICROCANTHUS STRIGATUS Cuvier and Valenciennes; Honolulu.

Family TEUTHIDIDÆ.

20. TEUTHIS GUTTATUS (Bloch and Schneider); Honolulu.
21. ZEBRASOMA FLAVESCENS (Bennett); Honolulu.
(*Acanthurus virgatus* VAILLANT and SAUVAGE, YOUNG.)
22. ZEBRASOMA VELIFERUM (Block); Honolulu.
(*Acanthurus hypselopterus* BLEEKER.)

Family MONACANTHIDÆ.

23. CANTHERINES SANDWICHIENSIS (Quoy and Gaimard); Honolulu.
24. STEPHANOLEPIS SPILOSOMUS (Lay and Bennett); Laysan.

Family TETRAODONTIDÆ.

25. TETRAODON LACRYMATUS Quoy and Gaimard; Laysan.
(*Tetraodon latifrons* JENKINS.)

Family OSTRACIDÆ.

26. OSTRACION CAMURUM Jenkins; Honolulu.
27. LACTORIA GALEODON Jenkins; Hilo.

Two specimens from stomach of *Coryphæna hippurus*, sent by Mr. Henshaw.

28. LACTORIA SCHLEMMERI Jordan and Snyder, new species.

This species is closely related to *L. diaphana* Bloch and Schneider, of Japan and the East Indies. Compared with Japanese examples it differs in having the spines better developed, and in greater number, there being two on the dorso-lateral ridge, one of which is opposite the large median spine, the other between the former and the orbital spine; also in having the carapace deeper in the region of the ventro-lateral ridge and broader near the anal fin, and the plates posterior to the pectoral less granular. The only Hawaiian form with which it might become confused is *L. galeodon* Jenkins. In this species the ventral portion of the carapace is not translucent, the orbital spines are longer and project in a more horizontal direction, and there are no spines on the dorso-lateral crest posterior to the orbit.

Head measured to gill opening 3.7 in length to base of caudal; depth 2.3; snout 4.6; eye 2.7 in head; D. 9; A. 9.

Anterior profile of head very steep, interrupted by a constriction one-third of distance between tip of snout and middle of interorbital space; interorbital space V-shaped when viewed from before, the depression extending almost to a level with upper edge of pupil; carapace with five ridges, the dorsal ridge scarcely evident, with a large spine located midway between tip of snout and base of caudal fin; dorso-lateral crest with three spines, the anterior projecting upward and forward from the orbit; the posterior located slightly behind middle of dorsal spine, midway between anterior edge of orbit and posterior end of carapace; the median, which is small and weak, located somewhat nearer to the orbital than the posterior spine; ventro-lateral ridge with four spines, the first very small, the second larger, located below dorsal spine, the posterior one projecting backward the distance between it and the one of the opposite side equal to distance between center of pupil and dorsal spine. Ventral surface of carapace convex, a slight median depression extending from breast to anal fin. Plates granular, except ten or twelve in the region posterior to pectoral fin, each with a central granule usually larger than the others.

Dorsal fin located midway between dorsal spine and end of carapace; base of anal fin occupying most of the space between vent and end of carapace; pectoral just behind vertical through posterior edge of orbit.

Dorsal portion of body dusky, with small dark spots scattered over snout and back; ventral half of carapace translucent, with zigzag dusky bars along the region of crest, the color following the vertical sutures between the plates; throat and breast with scattered dusky spots somewhat smaller than pupil.

One specimen. Type No. S440. Ichthyological Collections. Stanford University. Laysan Island. Length, 105 mm. Named for its discoverer, Mr. Max Schlemmer.

Family SCORPAENIDÆ.

29. SCORPAENOPSIS CATOCALA Jordan and Evermann; Honolulu; Hilo.

The specimen from Honolulu has the dark markings unusually intense. The dark spot between the fifth and seventh spines is deep black and well defined, while in other examples it is indistinct or even absent. The ventral also markedly dark. Length of specimen, 150 mm.

30. DENDROCHIRUS CHLOREUS Jenkins; Honolulu.

Family CEPHALACANTHIDÆ.

31. CEPHALACANTHUS ORIENTALIS (Cuvier and Valenciennes); Honolulu.

Family ECHENEIDIDÆ.

32. REMORA REMORA (Linnæus); Honolulu.

Family FIERASFERIDÆ.

33. FIERASFER UMBRATILIS Jordan and Evermann.

From the cavity of a Holothurian, at Hilo. Received from Mr. Henshaw.

Family BROTULIDÆ.

34. BROTULA MULTICIRRATA Vaillant and Sauvage; Honolulu.

(*Brotula townsendi* FOWLER).

Family PLEURONECTIDÆ.

35. PLATOPHRYS MANCUS (Broussonet).

(*Rhombus pantherinus* RÜPPELL).

(*Pusser marchionessarum* VALENCIENNES).

Honolulu.

Family ANTENNARIIDÆ.

36. ANTENNARIUS LAYSANIUS Jordan and Snyder, new species.

This species is distinguished by the following set of characters: Third dorsal spine movable only at tip, being closely bound down to the occiput and back; first spine long and slender, extending to middle of third; soft dorsal not nearly reaching caudal; color light with black spots.

Mouth large, the width equal to length of maxillary, 4.5 times diameter of eye. First spine long and slender, reaching middle of third when depressed, the tip with a small knob bearing filaments one of which is lanceolate, seven-eighths the length of spine, the others short and thread-like. Second spine inserted above anterior edge of orbit, reaching base of third when depressed, connected posteriorly with head by a thin membrane, the free edge of which is convex, the tip of spine with a movable joint. Third spine equal in length to maxillary, immovably and closely attached throughout its length to the occiput and back, the tip with a small, movable joint. Soft dorsal not connected with third spine by a membrane or crest, separated from the caudal by a space equal in length to 2.5 times diameter of eye, the last rays when depressed not reaching base of caudal; rays 12, the longest (posterior) equal in length to distance between base of first dorsal spine and tip of second when depressed; posterior margin of fin rounded; anal when depressed reaching base of caudal, rays 7, about equal in length to those of dorsal. Caudal rounded. Gill opening at base of pectoral.

Skin hispid with minute, simple, and bilobed lobed prickles; skin of upper half of eye with prickles; minute, filamentous, dermal appendages scattered about over the sides and back, especially prominent below dorsal spines and fin; none on ventral surface.

Color in spirits yellowish white, densely clouded with white dusky; a small ocellus midway between base of pectoral and origin of soft dorsal, many small black spots scattered about on breast and belly, an oblong black spot half as large as eye on posterior half of soft dorsal, a row of black spots along edge of dorsal fin, a large one on base of anal and two near border of fin; caudal with a few spots as large as pupil; dorsal, caudal, and anal narrowly edged with white; pectorals white below, dusky above; chin dusky, with an indistinct light ocellus; tongue with small black spots; filaments of dorsal dusky.

Type.—No. 8439, Ichthyological Collections, Stanford University, Laysan Island. Length, 97 mm.

37. ANTENNARIUS SANDVICENSIS (Bennett).

(*Antennarius horridus* BLEEKER).

One specimen from Honolulu corresponding closely to fig. C, plate 100 in Günther's *Fische der Südsee*. It is there regarded as a variety of *Antennarius commersoni*. Our specimen certainly corresponds to Bleeker's *horridus* and probably to Bennett's *sandvicensis*.

Eye very small, its diameter contained three times in length of maxillary. First spine hair-like, its length equal to that of maxillary, reaching beyond base of third spine when depressed, the tip with a cluster of short filaments; second spine reaching base of third when depressed, surrounded by thickened tissue, the membrane extending from near tip of spine to base of third, very thin; third spine easily elevated, connected with occiput by a thick membrane, the spine surrounded by a large amount of tissue, its width equal to diameter of eye; spine when depressed not reaching soft dorsal. Dorsal of the same height throughout, just reaching base of caudal when depressed; rays 12. Anal reaching beyond base of caudal, its edge rounded; length of space between base of anal and caudal one-half that between base of dorsal and caudal. Caudal rounded, its length $2\frac{1}{2}$ in length of body. Anal opening at base of pectoral.

Skin with very fine prickles, a few small cutaneous flaps on head, chin, and back.

Color in spirits light gray, thickly mottled and spotted with dark gray; a few white-edged blackish spots on body and fins, located as follows: at base of third dorsal spine, at origin of dorsal between eighth and ninth dorsal rays, on side between origin of dorsal and base of pectoral, on side posterior to pectoral, on anal fin, on upper and on lower edge of caudal.

Length, 78 mm.